

Experimental assessment of the test station support structure rigidity by the vibration diagnostics method

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Abstract: The paper presents the results of the impact test. The test has been done to assess the rigidity of the test station support frame. Test station was designed and constructed to test different types of gearing and belt transmissions. The test station allows to simulate different operating conditions. The procedure of the tests can be both short-term and long-term with different load levels. The basic support frame structure of the test station was evaluated as insufficient based on the results of measurement and processing of the measured low and high frequency vibration values in the verification series of experimental tests. The basic failure of the original design were the significant resonance actions that were the results of the dominant sources of vibration being near the natural frequencies of the vertical and horizontal beams of the test station base. A structural design of the test station supporting frame was designed and implemented. The impact tests were used to determine the values of the natural frequencies of the most stressed parts of the supporting structure - vertical and horizontal beams, before and after implementation of structural modifications. The comparability of the impact test results was determined by adherence to identical measurement conditions.

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